UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/239,578	01/28/1999	KAPIL D. SINGH	109869-130041	6276

25943 7590 07/30/2003

SCHWABE, WILLIAMSON & WYATT, P.C.
PACWEST CENTER, SUITES 1600-1900
1211 SW FIFTH AVENUE
PORTLAND, OR 97204

EXAMINER	
SHARON, AYAL I	
ART UNIT	**PAPER NUMBER**
2123	19

DATE MAILED: 07/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

MAILED

JUL 3 0 2003

Technology Center 2100

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 19

Application Number: 09/239,578
Filing Date: January 28, 1999
Appellant(s): SINGH, KAPIL D.

Robert Watt
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 4/22/03.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The amendment after final rejection filed on 1/21/03 has been entered for purposes of appeal.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

Appellant's brief includes a statement that the following groups of claims:

Claims 1, 6-8, 13-16, 21-23, and 25-26 as Claim Group I
Claims 2-5, 9-12 and 17-20 as Claim Group II.
Claims 1-7 and 25-26 as Claim Group III.
Claims 1-2 and 25-26 as Claim Group IV.
Claims 8-24 as Claim Group V.
Claims 8 and 16 as Claim Group VI.

do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

1.Ansaldi et al. "Geometric modeling of solid objects by using a face adjacency graph representation", Proceedings of the SIGGRAPH '85 Conference on Computer Graphics, pp.131-139, 1985. (Henceforth "Ansaldi").

2. Zeid, Ibrahim. CAD/CAM Theory and Practice. 1991. pp.388-437.

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Issue I

1. Claim 24 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The limitation "**a first and second processor communicatively coupled to each other to correspondingly execute the first and second plurality of programming instructions**" is not adequately described in the specification.

Issue II

2. Claim 1 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Ansaldi. Ansaldi teaches the limitations of Claim 1:

> 1. In a computer system, a method of operation comprising: replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool, the first dependent graph having modeling information of the first mechanical design and the

replicated sub-graph having modeling information of a subpart of the first mechanical design; (Ansaldi: Fig. 1, Fig.2, Fig. 3, Fig. 4)

merging the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design. (Ansaldi: Fig.1, Fig.2, Fig. 3, Fig. 4)

3. Claim 2 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Ansaldi. Ansaldi teaches the limitations of Claim 1, as discussed above. Moreover, in regards to Claim 2:

2. The method of operation of claim 1 further comprising receiving identification of the subpart of the first mechanical design, and in response, identifying the sub-graph for replication. (Ansaldi: Fig.1, Fig.2, Fig. 3, Fig. 4)

4. Claim 3 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Ansaldi. Ansaldi teaches the limitations of Claim 2, as discussed above. Moreover, in regards to Claims 3:

3. The method of operation of claim 2, wherein said first dependent graph includes a first plurality of nodes correspondingly represent a first plurality of design variables of the first mechanical design, and a first plurality of arcs linking the first plurality of nodes in accordance with the first plurality of design variables' dependency on one another; and (Ansaldi: Fig.1, Fig.2, Fig. 3, Fig. 4)

said identification of the sub-graph for replication comprises correlating said received identification of the subpart to one or more nodes of said first plurality of nodes directly associated with the subpart, and following applicable ones of said first plurality of arcs to identify all other nodes of said first plurality of nodes to which the directly associated nodes are directly or indirectly dependent on. (Ansaldi: Fig.1, Fig.2, Fig. 3, Fig. 4)

5. Claim 4 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Ansaldi. Ansaldi teaches the limitations of Claim 3, as discussed above. Moreover, in regards to Claim 4:

4. The method of operation of claim 3 wherein said replication comprises copying said directly associated nodes, said nodes on which the directly associated nodes are dependent on, and the arcs linking these nodes to one another. (Ansaldi: Fig.1, Fig.2, Fig. 3, Fig. 4)

6. Claim 5 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Ansaldi. Ansaldi teaches the limitations of Claim 4, as discussed above. Moreover, in regards to Claim 5:

> 5. The method of operation of claim 4, wherein selected ones of the design variables of said replicated sub-graph are set to constant values, while others are eligible to have values variably assigned; and (Ansaldi: Fig.1, Fig.2, Fig. 3, Fig. 4)
>
> the method of operation further comprises receiving instructions to transform selected ones of the design variables set to constant values to design variables eligible for having values variably assigned, or to transform selected ones of the design variables eligible for having values variably assigned to having constant values assigned. (Ansaldi: Fig.1, Fig.2, Fig. 3, Fig. 4)

It is inherent that when making changes to an existing CAD/CAM drawing, certain parameters remain constant, while others are changed. Moreover, when making a sequence of changes to a geometric shape (e.g. elongating a cylinder), a parameter that is changed in a given step is held constant in other steps. So, it is inherent that variables that are changed go from being constant to being variable, and vice versa.

7. Claims 6 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Ansaldi. Ansaldi teaches the limitations of Claim 1, as discussed above. Moreover, in regards to Claims 6:

> 6. The method of operation of daim 1 further comprising receiving identification of a point or an area of the second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design. (Ansaldi: Fig. 1, Fig.2, Fig. 3, Fig. 4)

8. Claim 7 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Ansaldi. Ansaldi teaches the limitations of Claim 6, as discussed above. Moreover, in regards to Claim 7:

7. The method of operation of claim 6, wherein said second dependent graph includes a second plurality of nodes correspondingly represent a second plurality of design variables of the second mechanical design, and a second plurality of arcs linking the second plurality of

nodes in accordance with the second plurality of design variables' dependency on one another; and (Ansaldi: Fig.1, Fig.2, Fig. 3, Fig. 4)

said merging comprises correlating said received identification of the point/area to one or more nodes of said second plurality of nodes directly associated with the identified pointlarea, and attaching the replicated sub-graph to the second dependent graph by selectively linking nodes of the replicated sub-graph to the correlated nodes of the second dependent graph. (Ansaldi: Fig.1, Fig.2, Fig. 3, Fig. 4)

9. Claim 25 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Ansaldi. Ansaldi teaches the limitations of Claim 25:

25. An apparatus comprising:
means to replicate a subset of a first modeling representation of a first mechanical design responsive to instructions identifying a subpart of the first mechanical design;
(Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

means to merge the replicated subset into a second modeling representation of a second mechanical design of the CAD tool to reuse the identified subpart of the first mechanical design in the second mechanical design. (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

10. Claim 26 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Ansaldi. Ansaldi teaches the limitations of Claim 26:

26. In a computer system, a method of operation comprising the steps of:
replicating a subset of a first modeling representation of a first mechanical design of a computer aided design (CAD) tool responsive to instructions identifying a subpart of the first mechanical design;
and
(Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

merging the replicated subset into a second modeling representation of a second mechanical design of the CAD tool to reuse the identified subpart of the first mechanical design in the second mechanical design. (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

Issue III

11. Claim 1 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Zeid. Zeid teaches the limitations of Claim 1:

1. In a computer system, a method of operation comprising: replicating a sub-graph from a first dependent graph of a first mechanical

design of a computer aided design (CAD) tool, the first dependent graph having modeling information of the first mechanical design and the replicated sub-graph having modeling information of a subpart of the first mechanical design;
(Zeid: especially p.392-393)

merging the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design.
(Zeid: especially pp.412-413)

12. Claim 2 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Zeid. Zeid teaches the limitations of Claim 1, as discussed above. Moreover, in regards to Claim 2:

2. The method of operation of claim 1 further comprising receiving identification of the subpart of the first mechanical design, and in response, identifying the sub-graph for replication.
(Zeid: especially pp.392-393)

13. Claim 25 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Zeid. Zeid teaches the limitations of Claim 25:

25. An apparatus comprising:
means to replicate a subset of a first modeling representation of a first mechanical design responsive to instructions identifying a subpart of the first mechanical design;
(Zeid: especially p.392-393)

means to merge the replicated subset into a second modeling representation of a second mechanical design of the CAD tool to reuse the identified subpart of the first mechanical design in the second mechanical design.
(Zeid: especially pp.392-393)

14. Claim 26 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Zeid. Zeid teaches the limitations of Claim 26:

26. In a computer system, a method of operation comprising the steps of:
replicating a subset of a first modeling representation of a first mechanical design of a computer aided design (CAD) tool responsive to instructions identifying a subpart of the first mechanical design;
and
(Zeid: especially pp.392-393)

merging the replicated subset into a second modeling representation of a second mechanical design of the CAD tool to reuse the identified subpart of the first mechanical design in the second mechanical design.
(Zeid: especially pp.392-393)

Issue IV

15. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansaldi in view of Official Notice. The applicant claims:

8. An article of manufacture comprising:
a recordable medium having recorded thereon a plurality of programming instructions for use to program an apparatus to enable the apparatus to be able to replicate a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool, the first dependent graph having modeling information of the first mechanical design and the replicated sub-graph having modeling information of a subpart of the first-mechanical design, and to be able to merge the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design.

Ansaldi teaches the creation and merging of graphs and sub-graphs as described in the claim, as discussed above (Ansaldi: Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138). Moreover, Ansaldi specifically teaches that ... we designed an experimental geometric modeling system for defining and manipulating the boundary of three-dimensional objects with planar faces, so as to demonstrate the practical advantages deriving from the use of our model in a CAD application." (p.131 last paragraph). However, Ansaldi does not specifically teach the use of a recordable medium having a plurality of programming instructions.

Official Notice is given that at the time of the invention, it would have been obvious and well known to one of ordinary skill in the art to utilize a recordable medium (e.g. hard-drive, CD-ROM, floppy disk) in order to store software applications or the files generated by software applications.

Moreover, at the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the teachings of Ansaldi by using a recordable medium in order to be able to store work that is performed because doing so enables the storage of the results of the simulation for future use.

16. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansaldi in view of Official Notice. Ansaldi teaches the limitations of Claim 8, as discussed above. Moreover, Ansaldi teaches the limitations of Claim 9:

> 9. The article of claim 8, wherein the programming instructions further enable the apparatus to be able to receive identification of the subpart of the first mechanical design, and in response, identify the sub-graph for replication. (Ansaldi: p.131 last paragraph)

17. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansaldi in view of Official Notice. Ansaldi teaches the limitations of Claim 9, as discussed above. Moreover, Ansaldi teaches the limitations of Claim 10:

> 10. The article of claim 9, wherein
> said first dependent graph includes a first plurality of nodes correspondingly represent a first plurality of design variables of the first mechanical design, and a first plurality of arcs linking the first plurality of nodes in accordance with the first plurality of design variables' dependency on one another; and
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)
>
> the programming instructions further enable the apparatus to be able to identify the sub-graph for replication by correlating said received identification to one or more nodes of said first plurality of nodes directly associated with the subpart, and then following applicable ones of said first plurality of arcs to identify all other nodes of said first plurality of nodes to which the directly associated nodes are directly or indirectly dependent on. (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

18. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansaldi in view of Official Notice. Ansaldi teaches the limitations of Claim 10, as discussed above. Moreover, Ansaldi teaches the limitations of Claim 11:

> 11. The article of claim 10 wherein the programming instructions further enable the apparatus to be able to replicate the identified sub-graph by copying said directly associated nodes, said

nodes the directly associated nodes are dependent on, and the arcs linking these nodes to one another. (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

19. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansaldi in view of Official Notice. Ansaldi teaches the limitations of Claim 11, as discussed above. Moreover, in regards to Claim 12:

12. The article of claim 11, wherein selected ones of the design variables of said replicated sub-graph are set to constant values, while others are eligible to have values variably assigned; and the programming instructions further enable the apparatus to be able to receive instructions to transform selected ones of the design variables set to constant values to design variables eligible for having values variably assigned, or to transform selected ones of the design variables eligible for having values variably assigned to having constant values assigned. (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

Ansaldi does not specifically teach design variables that are set to either constant or variable values. However, at the time of the invention, it would have been obvious to one of ordinary skill in the art that when making changes to an existing CAD/CAM drawing, certain parameters remain constant, while others are changed because doing so enables making changes on part of the drawing while leaving the other parts untouched.

Moreover, it would have been obvious that when making a sequence of changes to a geometric shape, a parameter that is changed in a given step (e.g. height is changed when elongating a cylinder) is held constant in other steps (e.g. height is constant when increasing the radius of a cylinder). It would have been obvious at the time of the invention to include this feature because doing so enables making changes on part of the drawing while leaving the other parts untouched.

20. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansaldi in view of Official Notice. Ansaldi teaches the limitations of Claim 8, as discussed above. Moreover, Ansaldi teaches the limitations of Claim 13:

> 13. The article of claim 8, wherein the programming instructions further enable the apparatus to be able to receive identification of a point or an area of the second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design.
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

21. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansaldi in view of Official Notice. Ansaldi teaches the limitations of Claim 13, as discussed above. Moreover, Ansaldi teaches the limitations of Claim 14:

> 14. The article of claim 13, wherein
> said second dependent graph includes a second plurality of nodes correspondingly represent a second plurality of design variables of the second mechanical design, and a second plurality of arcs linking the second plurality of nodes in accordance with the second plurality of design variables' dependency on one another; and
> (Ansaldi: p.131 last paragraph, Fig. 1, Fig.2, Fig. 3, Fig. 4, pp.132-138)
>
> the programming instructions further enable the apparatus to be able to correlate the received identification of the pointlarea to one or more nodes of said second plurality of nodes directly associated with the identified point/area, and to attach the replicated sub-graph to the second dependent graph by selectively linking nodes of the replicated sub-graph to the correlated nodes of the second dependent
> graph. (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

22. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansaldi in view of Official Notice. Ansaldi teaches the limitations of Claim 8, as discussed above. Moreover, Ansaldi teaches the limitations of Claims 15:

> 15. The article of claim 8, wherein the programming instructions are integral part of a computer aided design tool. (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

23. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansaldi in view of Official Notice. The applicant claims:

> 16. An apparatus comprising: at least one storage medium having stored therein a first and a second plurality of programming instructions; and

at least one processor coupled to the at least on storage medium to execute the first plurality of programming instructions to replicate a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool, the first dependent graph having modeling information of the first mechanical design and the replicated sub-graph having modeling information of a subpart of the first mechanical design, and to execute the second plurality of programming instructions to merge the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design.

Ansaldi teaches the creation and merging of graphs and sub-graphs as described in the claim, (Ansaldi: Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138). Moreover, Ansaldi specifically teaches that °... we designed an experimental geometric modeling system for defining and manipulating the boundary of threedimensional objects with planar faces, so as to demonstrate the practical advantages deriving from the use of our model in a CAD application." (p.131 last paragraph). However, Ansaldi does not specifically teach the use of a storage medium having a plurality of programming instructions, nor of the use of a processor.

It is inherent that a CAD/CAM system, being a computer system, has one or more processors to execute the programming instructions.

Official Notice is given that at the time of the invention, it would have been obvious and well known to one of ordinary skill in the art to utilize a storage medium (e.g. hard-drive, CD-ROM, floppy disk) in order to store software applications or the files generated by software applications.

It would have obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Ansaldi by using a storage medium in order to store of the results of the simulation for future use.

24. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansaldi in view of Official Notice. Ansaldi teaches the limitations of Claim 16, as discussed above. Moreover, in regards to Claims 17:

17. The apparatus of claim 16, wherein the at least one processor further executes the second plurality of programming instructions to receive identification of the subpart of the first mechanical design, and in response, identify the sub-graph for replication.
(Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

It is inherent that a CAD/CAM system, being a computer system, has at least one processor to execute the programming instructions.

25. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansaldi in view of Official Notice. Ansaldi teaches the limitations of Claim 17, as discussed above. Moreover, in regards to Claim 18:

18.The apparatus of claim 17, wherein said first dependent graph includes a first plurality of nodes correspondingly

represent a first plurality of design variables of the first mechanical design, and a first plurality of arcs linking the first plurality of nodes in accordance with the first plurality of design variables' dependency on one another; and
(Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

the at least one processor further executes the first plurality of programming instructions to identify the sub-graph for replication by correlating said received identification of the subpart to one or more nodes of said first plurality of nodes directly associated with the identified subpart, and to follow applicable ones of said first plurality of arcs to identify all other nodes of said first plurality of nodes to which the directly associated nodes are directly or indirectly dependent on.
(Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

It is inherent that a CAD/CAM system, being a computer system, has at least one processor to execute the programming instructions.

26. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansaldi in view of Official Notice. Ansaldi teaches the limitations of Claim 18, as discussed above. Moreover, Ansaldi teaches the limitations of Claim 19:

19.The apparatus of claim 18 wherein the at least one processor further executes the first plurality of programming instructions to replicate the identified sub graph by copying said directly associated nodes, said nodes on which the directly associated nodes are dependent on, and the arcs linking the these nodes to one another.
(Ansaldi: p.131 last paragraph, Fig. 1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

It is inherent that a CAD/CAM system is able to produce copies ("replications"), in the computer memory, of elements of the drawings that are stored in the system memory.

27. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansaldi in view of Official Notice. Ansaldi teaches the limitations of Claim 19, as discussed above. Moreover, in regards to Claim 20:

20. The apparatus of claim 19, wherein
selected ones of the design variables of said replicated sub-graph are set to constant values, while others are eligible to have values variably assigned; and
(Ansaldi: p.131 last paragraph, Fig. 1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

the at least one processor further executes the second plurality of programming instructions to receive instructions to transform selected ones of the design variables set to constant values to design variables eligible for having values variably assigned, or to transform selected ones of the design variables eligible for having values variably assigned to having constant values assigned.
(Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

Ansaldi does not specifically teach design variables that are set to either constant or variable values. However, at the time of the invention, it would have been obvious to one of ordinary skill in the art that when making changes to an existing CAD/CAM drawing, certain parameters remain constant, while others are changed because doing so enables making changes on part of the drawing while leaving the other parts untouched.

Moreover, it would have been obvious that when making a sequence of changes to a geometric shape, a parameter that is changed in a given

step (e.g. height is changed when elongating a cylinder) is held constant in other steps (e.g. height is constant when increasing the radius of a cylinder). It would have been obvious at the time of the invention to include this feature because doing so enables making changes on part of the drawing while leaving the other parts untouched.

28. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansaldi in view of Official Notice. Ansaldi teaches the limitations of Claim 16, as discussed above. Moreover, Ansaldi teaches the limitations of Claim 21:

> 21. The apparatus of claim 16, wherein the at least one processor further executes the second plurality of programming instructions to receive identification of
>
> a point or an area of the second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design.
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

It is inherent that a CAD/CAM system, being a computer system, has at least one processor to execute the programming instructions.

29. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansaldi in view of Official Notice. Ansaldi teaches the limitations of Claim 21, as discussed above. Moreover, Ansaldi teaches the limitations of Claim 22:

> 22. The apparatus of claim 21, wherein
> said second dependent graph includes a second plurality of nodes correspondingly represent a second plurality of design variables of the second mechanical design, and a second plurality of arcs linking the second plurality of nodes in accordance with the second plurality of design variables' dependency on one another; and
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)
>
> the at least one processor further executes the second plurality of programming instructions to correlate the received identification of the point/area to one or more nodes of said second plurality of nodes directly associated with the identified pointlarea, and to attach the replicated sub-graph to the second dependent graph by selectively linking nodes of the replicated sub-graph to the correlated nodes of the second dependent graph.
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

30. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansaldi in view of Official Notice. Ansaldi teaches the limitations of Claim 16, as discussed above. Moreover, Ansaldi teaches the limitations of Claims 23:

> 23. The apparatus of claim 16, wherein the at least one processor consists of a processor executing both the first and second plurality of programming instructions.
> (Ansaldi: p.131 last paragraph, Fig. 1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

It is inherent that a CAD/CAM system, being a computer system, has at least one processor to execute the programming instructions.

31. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansaldi in view of Official Notice. Ansaldi teaches the limitations of Claim 16, as discussed above. Moreover, in regards to Claims 24:

> 24. The apparatus of claim 16, wherein the at least one processor comprises a first and a second processor communicatively coupled to each other to correspondingly execute the first and second plurality of programming instructions.
> (Ansaldi: p.131 last paragraph, Fig.1, Fig.2, Fig. 3, Fig. 4, pp.132-138)

Ansaldi does not teach the use of two coupled processors to execute the programming instructions. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a personal computer that had both a CPU, as well as a math co-processor or graphics-specific processor embedded in a "graphics card" in order to speed up the execution time of the software.

Issue V

32. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zeid in view of Official Notice. The applicant claims:

> 8. An article of manufacture comprising:
> a recordable medium having recorded thereon a plurality of programming instructions for use to program an apparatus to enable the apparatus to be able to replicate a sub-graph from a first dependent graph of a first mechanical design of a

computer aided design (CAD) tool, the first dependent graph having modeling information of the first mechanical design and the replicated sub-graph having modeling information of a subpart of the first-mechanical design, and to be able to merge the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design.

Zeid teaches the creation and merging of graphs and sub-graphs as described in the claim, (Zeid: especially pp.392-393 and pp.412-413). Moreover, Zeid's teaching is directly related to CAD applications (see title). However, Zeid does not specifically teach the use of a recordable medium having a plurality of programming instructions.

Official Notice is given that at the time of the invention, it was obvious and well known to one of ordinary skill in the art to utilize a recordable medium (e.g. harddrive, CD-ROM, floppy disk) in order to store software applications or the files generated by software applications.

Moreover, at the time of the invention, it would have obvious to one of ordinary skill in the art to modify the teachings of Zeid by using a recordable medium in order to be able to store work that is performed.

33. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zeid. The applicant claims:

16. An apparatus comprising: at least one storage medium having stored therein a first and a second plurality of programming instructions; and

at least one processor coupled to the at least on storage medium to execute the first plurality of programming instructions to replicate a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool, the first dependent graph having modeling information of the first mechanical design and the replicated sub-graph having modeling information of a subpart of the first mechanical design, and to execute the second plurality of programming instructions to merge the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design.

Zeid teaches the creation and merging of graphs and sub-graphs as descried in the claim, (Zeid: especially pp.392-393 and pp.412-413). Moreover, Zeid's teaching is directly related to CAD applications (see title). However, Zeid does not specifically teach the use of a storage medium having a plurality of programming instructions, nor of the use of a processor.

It is inherent that a CAD/CAM system, being a computer system, has one or more processors to execute the programming instructions.

Official Notice is given that at the time of the invention, it would have been obvious and well known to one of ordinary skill in the art to utilize a storage medium (e.g. hard-drive, CD-ROM, floppy disk) in order to store software applications or the files generated by software applications.

It would have obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Zeid by using a storage medium in order to store of the results of the simulation for future use.

(11) Response to Arguments

Issue I – Claim Group I

Examiner rejected Claim 1 under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In particular, Examiner

reasoned that the limitations "**replicating a sub-graph**" and "**merging the replicated sub-graph**" were not adequately described in the specifications.

Appellant argues (paper #18, pp.5) that Examiner did not meet the initial burden required to establish a reasonable basis to question the enablement provided for the claimed invention, and cited the precedent of *In re Wright,* 999 F.2d 1557, 1562, 27 USPQ2d 1510, 1513 (Fed. Circ. 1993).

Appellant also argues that (paper #18, p.6) that:

> Nevertheless, in furtherance of the Appellant's position that the limitations "**replicating a sub-graph**" and "**merging the replicated sub-graph** ..." are adequately discussed in the specification, Appellant submitted a declaration under 37 C.F.R. §1.132 related to enablement of such claim elements. ...
>
> In support of Appellant's position, Appellant submitted a declaration by Mark Lambert, a person ordinarily skilled in the art, attesting to the fact that he is able to practice the present invention without further experimentation.

In the filed Affidavit (paper #12), Mr. Mark Warren Lambert, an engineer with a B.S. in Computer Science, a B.S. and a M.S. in Mechanical Engineering, and 17 years of work experience, of which 7 years have been as a Computer Aided Design (CAD) software engineer, testifies that he is a person of ordinary skill in the art of CAD.

Moreover, Mr. Lambert testifies (paper #12, pp.1-2) that:

> Based on this disclosure, at the time of the filing of this application, I would have been able to replicate a sub-graph (page 11, lines 4-7) from a dependent graph of a mechanical design. Furthermore, at the time of the filing of this application as a result of the disclosure, I would be able to merge the replicated sub-graph (see claim 1 and page 11, lines 13-15) into a second dependent graph of another mechanical design. I would have been able to perform both of these tasks without having to perform further experimentation.

In light of Mr. Lambert's testimony, Examiner is withdrawing the 35 U.S.C. 112, first paragraph rejections of Claims 1-26 that were based on the limitations "**replicating a sub-graph**" and "**merging the replicated sub-graph**".

Issue I – Claim Group II

Examiner rejected Claim 1 under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In particular, Examiner reasoned that the limitation "**identifying the sub-graph for replication**" was not adequately described in the specifications.

Appellant argues (paper #18, pp.7-9) that Examiner did not meet the initial burden required to establish a reasonable basis to question the enablement provided for the claimed invention.

Appellant also argues that (paper #18, p.8) that:

Appellant respectfully submits that the paragraph beginning on page 10, line 16 and continuing through page 11, line 17 discloses how to identify the sub-graph for replication.

Appellant respectfully submits that the paragraph beginning on page 10, line 16 and continuing through page 11, line 17 discloses how to identify the sub-graph for replication. If a portion of the design is selected, vis-a-vis a portion of the design's dependant graph, then the nodes of the dependant graph directly associated with the selected portion of the design are determined (Fig 4, item 408, page 10, lines 22-23).

Note that if one has selected a portion of the dependant graph instead of the dependant graph's design, implicitly one has already identified the directly associated nodes as these nodes are, by definition, selected. After having this set of directly associated nodes, the modeler determines the dependant graph nodes dependant, directly and indirectly, on these identified nodes by tracing the graph (Fig 4, item 410, page 10 line 24 through page 11 line 1). Tracing techniques (known in the art) are used to systematically follow the linking arcs to the nodes upon which the directly associated nodes are dependant (page 11 lines 1 through 4).

Thus, Appellant respectfully submits that the limitation of how to implement 'identifying the sub-graph for replication' is adequately described to enable one skilled in the art to practice the invention.

Additionally, Appellant has provided a statement, from a person ordinarily skilled in the art, that the specification provides a person ordinarily skilled in the art with sufficient disclosure to be able to practice the present invention, without undue experimentation. Specifically, a

statement has been provided from Mark Lambert, an engineer skilled in the art, that the specification provides sufficient information for a person to be able to determine "how" to identify the sub-graph for replication.

In light of Appellant's arguments, and Mr. Lambert's testimony, Examiner is withdrawing the 35 U.S.C. 112, first paragraph rejections of Claims 2-5, 9-12 and 17-20 that were based on the limitation "**identifying the sub-graph for replication**".

Issue I – Claim 24

Examiner rejected Claim 24 under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In particular, Examiner reasoned that the limitation "**a first and second processor communicatively coupled to each other to correspondingly execute the first and second plurality of programming instructions**" was not adequately described in the specifications.

Appellant argues in the Appeal Brief (paper #18, pp.10-11) that Examiner did not meet the initial burden required to establish a reasonable basis to question the enablement provided for the claimed invention.

Appellant also argues in the Appeal Brief that (paper #18, pp.10-11) that:

Second, Examiner states that the arguments of counsel cannot take the place of evidence in the record.

However, Appellant proffered evidence that it was well known that as early as the 1980's a multi-processor super computer was developed by Cray, Inc. of Seattle, Washington, known as Cray X-MP™. In 1988, Cray Research introduced the Cray Y-MP®, the world's first

supercomputer to sustain over 1 gigaflop on many applications. *Multiple 333 MFLOPS processors* powered the system to a record sustained speed of 2.3 gigaflops. See "Cray, Inc. History" at hftp://www.cray.com/company/history.htmi.

For further reading on multiprocessor UNIX systems, see MAURICE ,I. BACH, THE DESIGN OF THE UNIX OPERATING SYSTEM, 391411, 1986. Specifically, section 12.2 of Bach, pp. 393-395, describes a solution for a multiple processor system where processes, e.g. a plurality of instructions, are scheduled onto two different processors based on a scheduling algorithm.

Thus, for at least the reasons set forth above, limitations of claim 24 are presented in the specification using languages and terminologies at a level that is consistent with the manner persons skilled in the relevant art present their works to one another, thereby satisfying at least the enablement requirements of 35 U.S.C. §112, first paragraph.

Appellant's arguments in paper #10 regarding the same issue were as follows:

In general, one skilled in the art will recognize that this limitation pertains to multi-processor environments incorporating the invention. Mulit-processor environments have been known for a relatively long period. For example, at minimum it was well known that as early as the 1980's a multi-processor super computer was developed by Cray, Inc. of Seattle, Washington, known as Cray X-MP™.

Thus, for at least this reason, Applicant respectfully asserts that limitations of Claim 24 are presented in the using languages and terminologies at a level that is consistent with the manner persons skilled in the relevant art present their works to one another, thereby satisfying at least the enablement requirements of 35 U.S.C. §112, first paragraph.

Examiner respectfully disagrees with Appellant's argument that the Claim 24 is enabled. In a new argument introduced in the Appeal Brief (paper #18), Appellant cites a reference that broadly describes multi-processor task scheduling in UNIX.

The multi-processor task scheduling in UNIX that the Appellant refers to is the UNIX operating system's feature, which is well known in the art, of optimizing the running speed of multiple programs ("processes") running at the same time on a multi-processor computer by running different programs ("processes") on different processors.

However, it does not teach optimizing the running speed of a single program on a multi-processor computer (by dividing up the tasks in the specific application), much less doing so to the specific application claimed in the independent claims.

Moreover, it is well known in the art that it is a non-trivial task to design a multi-threaded software application that can take advantage of the speed benefits provided by multi-processing. It is also well known that these features must be programmed into the source code of the program.

Therefore, given that the specification is silent about this issue, Examiner finds that Appellant's disclosure would place a burden of undue experimentation on one of ordinary skill in the art in trying to make and/or use the claimed invention such that "**a first and second processor communicatively coupled to each other to correspondingly execute the first and second plurality of programming instructions**".

Examiner is therefore maintaining the rejection of Claim 24.

Note: In order to aid the reader, the discussion of claim rejections based on the Zeid reference (Issues III and V) are addressed before those based on the Ansaldi reference (Issues II and IV). This is because the Zeid reference is more concise.

Issue III

Examiner rejected Claims 1-2, 25 and 26 under 35 U.S.C. 102 as being clearly anticipated by Zeid.

Appellant argues (paper #18, pp.11-12) that:

Zeid is cited at 392-393 for teaching replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool. *Zeid* however discloses a Constructive Solid Geometry (CSG) graph. A CSG graph is a symbolic representation of, and is intimately related to, the modeling steps used by the user to create a model.

Thus, the CSG is useful in creating a typical solid as shown in Figure 7-41 by graphically representing the process by which primitives of a solid are combined to make the solid.

In other words, *Zeid* discloses an efficient data structure, the CSG, to define and edit a solid. *Zeid* does not suggest or disclose **replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool** (for the purpose of reusing the corresponding subpart of the first mechanical design in a second mechanical design, by merging the replicated sub-graph into the dependent graph of the second mechanical design).

Appellant admits that "the CSG is useful in creating a typical solid as shown in Figure 7-41 by graphically representing the process by which primitives of a solid are combined to make the solid", yet argues that "*Zeid* does not suggest or disclose **replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool.**"

Examiner respectfully disagrees. First of all, Zeid teaches (p.392 - opposite Fig.7-41) that "A block and a cylinder primitive are enough to create the CSG [Constructive Solid Geometry] model of the solid. Figure 7-41*b* shows one of the possible ways to decompose the solid into its primitives."

Zeid (p.392) also teaches that the following "primitives" are duplicates of one another: "$B_4 = B_3$", "$C_2 = C_1$" and "$C_4 = C_3$". This is also evident from their representation in the mechanical design, Fig.7-41b.

The caption to Zeid's Fig.7-42 teaches that it is a CSG graph (equivalent to Appellant's "first dependent graph") of "a typical solid" (equivalent to Appellant's "first mechanical design") as shown in Fig.7-41.

The "sub-graphs" of the the CSG graph in Fig.7-42 are labeled B_1, B_2, S_1, S_2, etc. Sub-graph S_1, for example, consists of the union of "primitives" B_1 and B_3. It is taught in Zeid (p.392) that some sub-graphs (e.g. B_3 and B_4) are "replicates" of one another as defined in the specification of the instant application (see p.11, lines 5-7): "modeler 102 replicates the sub-graph, i.e. creating a copy of the identified dependent and independent nodes, and their linking arcs."

Finally, the title of the Zeid reference is "CAD/CAM Theory and Practice." It is inherent from the title and from the Figures 7-41 and 7-42 on pp.392-393 that the teachings are targeted to mechanical designs of a computer aided design (CAD) tool, as claimed by the Appellant.

Examiner therefore finds that "*Zeid* does suggest **replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool"**, and is therefore maintaining the rejection.

Issue V

Examiner rejected Claims 8 and 16 under 35 U.S.C. 103 as being unpatentable over Zeid in view of Official Notice.

Appellant argues (paper #18, pp.16-17) that Zeid does not teach all the limitations of the rejected claims that were not covered by Official Notice. More specifically, Appellant argues that:

> However, as discussed above, Appellant respectfully submits that Zeid does not teach **replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool** or the **merging the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design.** Thus, Zeid does not teach the basic elements upon which the 35 U.S.C. §103(a) rejection is based.
>
> Assuming, arguendo, that it would have been obvious and well known to one of ordinary skill in the art to utilize a storage/recordable medium, claims 8 and 16 are nevertheless not obvious over Zeid in view of Official Notice as the basic elements upon which the rejections are based are not taught by *Zeid.* Thus, for at least the reasons set forth above, claims 8 and 16 are patentable over *Zeid* in view of Official Notice.

Examiner has argued (see Examiner's Response regarding Issue III) that Zeid *does indeed* teach "replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool". This can be seen in the "Primitives' definitions" section of Zeid, p.392.

Examiner also finds that Zeid teaches the following limitation:

> "merging the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design",

Zeid expressly teaches a "construction" / union function, represented by the symbol "U*". This union of "primitives" is equivalent to Appellant's term: "merging".

The replicated primitives of p.392 (B_3 and B_4, C_1 and C_2, C_3 and C_4) are separately merged into two different dependent graphs (S_3 and S_6) of two different mechanical designs. B_3, C_1, and C_3 are merged into S_3, while B_4, C_2,

and C_4 are merged into S_6. Therefore the subparts of each design (e.g. S_3) are reused in the other (e.g. S_6).

Examiner is therefore maintaining the rejections.

Issue II

Examiner rejected Claims 1-7, 25 and 26 under 35 U.S.C. 102 as being clearly anticipated by Ansaldi.

Appellant argues (paper #18, pp.11-12) that:

> In detail, the Examiner has cited page 139, column 1, lines 9-20, and Figure 2(d) in regards to **replicating** and **merging** a sub-graph. Figure 2(d)'s description, unrelated to the discussion on page 139, is discussed in the last paragraph of page 133, column 2. The discussion in these passages focuses on joining two faces f and f belonging to **two different shells** *s* and *s'*. That is, shell *s* and shell *s'* are different shells. Thus, there is no discussion of **replicating** *a sub-graph from a dependant graph of a first mechanical design* of a computer aided design (CAD) tool.
>
> Further, lines 9-20 in column 1 of page 139 do not provide further insight with respect replicating and merging a sub-graph. Lines 9-16 discuss the fact that every shell of an object is represented by a different component in its face adjacency graph and that the decomposition of the face adjacency graph allows for recognition of special topological features. Lines 17-20 suggest that the face adjacency graph has been demonstrated to be a valid model in practical applications. Lines 9-20 in column 1 of page 139 says nothing with respect to replicating a sub-graph from a first dependant graph nor does it says anything with respect to merging a replicated sub-graph of a first mechanical design into a second mechanical design.
>
> Thus, Appellant respectfully submits that *Ansaldi* does not disclose or suggest **replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool or the merging the replicated sub-graph (of the first mechanical design) into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design.**

Examiner respectfully disagrees with Appellant's argument that "shell s and shell s' [in Figure 2(d)] are different shells". Upon close inspection of the two Face Adjacency Graphs [FAGs] that represent shells s and s', Examiner finds that they are duplicates of one another (albeit rotated 180 degrees). Moreover,

close inspection will also show that shell s is the same figure as shown in Fig.1(b). Therefore shell s is a FAG that represents a cube. A rotated cube is still a cube, so shell s' is a duplicate of shell s – or, in the Appellant's terminology, they are "**replications**".

Moreover, during the process of merging shells s and s' that is taught in Fig. 2(d), node f' is removed from shell s. Therefore, modified shell s becomes a replicated sub-graph of original shell s, thereby reading on the limitation of the claim, "**replicating** a sub-graph from a dependant graph of a first mechanical design".

As stated in the Appellant's argument above, Examiner cited page 139, column 1, lines 9-20 of Ansaldi in the rejection. That section of Ansaldi teaches the following:

> As shown in /2/, every shell of an object is represented by a different component in its FAG [Face Adjacency Graph – ed.] and also the decomposition of the FAG into its biconnected and triconnected components /10/ allows a recognition of special topological features of the object, like depressions, protrusions, handles or through holes, these being related to the node connectivity of the FAG.

Examiner finds that by teaching the "decomposition of the FAG into its bi-connected and tri-connected components" this section of Ansaldi inherently teaches that a Face Adjacency Graph [FAG] is composed from its bi-connected and tri-connected components. In other words, it is inherent that the components are merge in order to created the complete product. This is functionally equivalent to the claimed "the **merging** of sub-graphs" in the instant application. Moreover, the use of the plural in the phrase "recognition of special topological

features of the object, like depressions, protrusions, handles, or through holes" implies **replication** of these features.

Examiner therefore finds that the cited section of Ansaldi reads upon the claimed limitation of "**replicating** *a sub-graph from a dependant graph of a first mechanical design*",

Examiner is therefore maintaining the rejections.

Issue IV

Examiner rejected Claims 8-24 under 35 U.S.C. 103 as being unpatentable over Ansaldi in view of Official Notice.

Appellant argues (paper #18, pp.11-13) that Ansaldi does not teach all the limitations of the rejected claims that were not covered by Official Notice. More specifically, Appellant argues that:

> However, as discussed above, Appellant respectfully submits that Zeid does not teach **replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool** or the **merging the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design.** Thus, Ansaldi does not teach the basic elements upon which the 35 U.S.C. §103(a) rejection is based.
>
> Assuming, arguendo, that it would have been obvious and well known to one of ordinary skill in the art to utilize a storage/recordable medium, claim 8 is nevertheless not obvious over *Ansaldi* in view of Official Notice as the basic elements upon which the rejection is based are not taught by *Ansaldi.* Thus, for at least the reasons set forth above, independent claim 8 is patentable over *Ansaldi* in view of Official Notice.

Examiner has argued (see Examiner's Response regarding Issue II) that Ansaldi *does indeed* teach "replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool" and "merging the replicated sub-graph into a second dependent graph of a second mechanical

design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design". This can be seen in Figure 2(d) and page 139, column 1, lines 9-20 of Ansaldi.

Appellant has repeated this argument for dependent claims 9-15, and for claims 16-24.

Examiner is therefore maintaining the rejections.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

July 15, 2003

Conferees:

Ayal Sharon
(Examiner)

William Thomson
(Conferee)

KEVIN J. TESKA
SUPERVISORY
PATENT EXAMINER

Kevin Teska
(Conferee)

SCHWABE, WILLIAMSON & WYATT, P.C.
PACWEST CENTER, SUITES 1600-1900
1211 SW FIFTH AVENUE
PORTLAND, OR 97204